groove in a piece of brass wire one-eighth of an inch in diameter and one inch long. The ends of the pieces to be spliced were twisted about one another, and were then laid in the groove and soldered. The joints were all tested to strains of from 50 to 150 pounds, the strain being proportioned to the probable pull of the kites. The size of the wire used was made commensurate to the strain that it was expected to stand, the larger wire being reserved for the lower end of the line which would be compelled to bear the combined pull of all the kites.

The kites were taken to Twin Peaks a hill 1,000 feet high west of the city. One of the kites was broken in transporting them. Several attempts were made to hoist them before noon, but while a wind of from 15 to 30 miles an hour prevailed near the surface, the kites would only rise 200 or 300 feet above the hill, when they would float away and downward, apparently upon the top of the current. During this time only very light winds prevailed over the comparative level surface of the city. It would seem that the draught of air from the west was concentrated over the top of the range of hills, of which Twin Peaks form a part, thus causing the wind to be high near their summits, but lighter at a small distance above; the hills evidently served the purpose of a dam in the current of air. By one o'clock the wind was blowing a gale of not less than 45 miles an hour near the surface, which wrecked every kite exposed to it. At the office in the city the maximum velocity measured was 28 miles. After breaking several kites in attempting to hoist them the remainder were loaded on the dray and brought back to the city, but all but one were broken either on the hill or while returning.

The experience of this trip convinced the writer that some more portable kite was essential. With this end in view, he has designed a kite of the Potter form in which the frame folds, making the sticks parallel and in contact. A kite of this character, 82 inches long, 62 inches wide, and 32 inches thick and of more than 40 square feet in area has been made. It can be spread in five minutes and folded in an equal time, its gross weight is 3 pounds 4 ounces. It has been flown six or eight times during the past two months, and in winds of from 10 to 25 miles per hour; while somewhat less rigid than the common frame, it has proved equally durable and efficient.

During the past two months we have flown kites on eight or ten occasions. Nearly every afternoon, in the summer time, a west wind of about 30 miles per hour prevails in San Francisco. In every instance the kites rose rapidly through this current, which seems to reach its maximum force (as evidenced by its pull on the wire) within 500 feet of the surface. At an elevation of from 800 to 2,500 feet the kites reach a stratum in which they refuse to rise. On July 29 three kites were let out in tandem, and all three floated off one behind the other at an elevation of about 2,000 feet. I think that a strong proof that this surface current has a depth of only 800 to 2,500 feet.

However, on August 28, with only moderate west winds (about 14 miles per hour) two kites were hoisted. After an elevation of about 1,000 feet was reached the kites began to drift more and more to the northward, the pilot kite being 10° to 12° north of the lower, this resulted in greatly increasing the angle made by the kites, which rose higher and higher. The winds were light, as shown by the strain on the string, but elevations of from 50° to 58° were made with from 3,800 to 4,600 feet of wire. Unfortunately there were but two serviceable kites at the station, which were unable to lift more than 6,656 feet of wire. The angle to the upper kite was then 33°, indicating an elevation of 3,650 feet above the roof of the office building from which the kites were flown, or 3,850 feet above the bay over which the kites were suspended. This is the greatest height we have attained.[1]

On the next day another hoist was made and the same south current was met at an elevation of 1,200 feet but it was lighter than on the day before. Only at times was it strong enough to lift the kites. The sky was pretty cloudy on both these days and on the earlier date the kites were frequently above the clouds which had an elevation of about 2,000 feet.

On the second day there was a very marked electrification of the air. Sparks one-third of an inch long could be taken from the wire without the use of a condenser and the escaping discharge would make an audible whistling noise when the connecting wire was 1½ inches from the ground connection. It is well to observe that on the following night (Saturday) and Sunday general rain fell throughout northern California, the heaviest August rain in many places of which we have a record.

In conclusion we would summarize the work performed at this station as follows:

First. A flight of eighteen kites in tandem by Mr. McAdie on February 22.

Second. Construction of a cellular kite which so adjusts itself as to render more nearly constant the lifting power of the kite and strain on the string in winds of varying velocity.

Third. Measurement of the altitude of the summer winds on many occasions.

Fourth. Construction of an efficient folding cellular kite of the Potter kind.

Fifth. We have certainly flown kites higher above the surface than has been accomplished by any other person west of the Mississippi River, and probably higher than the greatest ever attained by balloon or kite in this region.

Sixth. Discovered the existence of an unusual south wind above the surface current from the west on two days before the heaviest August rain in northern California, and an unusual electrification of the atmosphere on the day preceding the storm.

In all this work Mr. McAdie has rendered valuable assistance. The initial experiments were performed by him and, in all, he has given his hearty cooperation.

THE HEATED TERM FROM JULY 28 TO AUGUST 17, 1896.

By Prof. H. A. HAZEN.

During these three weeks the temperature remained abnormally high from the middle and lower Mississippi valley to the Atlantic Coast. In Missouri the temperature on each of these days was 7° to 8° above the normal and in the Middle Atlantic States it was 5° to 6° above. This term covered a larger region and gave abnormal heat on a larger number of consecutive days than ever before recorded. It can not be said that there were specially abnormal conditions in the atmosphere so far as shown by the high and low areas of pressure. During most of the period the air pressure remained high in the Gulf States and was accompanied by light variable winds and an almost stagnant air which was probably heated to great heights. The storms went far to the north and had little or no influence in modifying the conditions. The ground became very hot and there was less radiation to cool it during the period. It is also probable that the atmosphere was favorable to intense surface insolation because of some condition not well understood.

[1] On September 19, 1896, an elevation of 4,150 feet above roof and 4,350 feet above the bay was reached. The upper kite was for a large portion of the time lost in the clouds, which had an elevation of about 4,000 feet.